

Work Order ID 85403

85403

June-07-12 10:35:08 AM

Item ID: D350-748-201

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube Installation, High Aft

Start Date: 07/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: *MCJ*

Date: *12/06/07* Tooling:

Run Start *NR1*

QC:

Date: SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
----------	--------------

D350-748-241	F
--------------	---

100

100

DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile & type labels per PPPD350-748-201

CHG002

0.00

0.00

DAS 16 12/06/20

MCJ 12/08/20

110

110

CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

Bend tube as per Dwg D350-748-241 using CNC bender program D350A and Folio FT

*****UNDER BEND .225" PER SIDE*****

0.00

0.00

DP 12-7-27

120

120

QC

Quality Control

QC15- Crosstube Dimensional Check

Memo

0.00

0.00

DAS 12.7.27

★ DONE AFTER STRESS RELIEF

Work Order ID 85403

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Revision ID:

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Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

125

0.00

125

HandFXtube

Hand Finishing Crosstubes

Memo

Stress relief

Heat treat crosstube as per QSI010 4.3

Temp:

Start time:

Finish time:

Issue PO 17550
Net 17550

650°F for min 2hrs

12-07-27

127

QC5- Inspect part completeness to step on W/O

0.00

127

QC

Quality Control

Memo

0.00

DAS 16 12/07/30

OK IS AFTER STRESS RELIEF (see previous page)

128

Receive & Inspect

12-07-30

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>	<input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>	<input type="checkbox"/>
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>	<input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>	<input type="checkbox"/>															

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other									
Process									
Supplier									
Training									
Unauthorized									

FAULT CATEGORY

Landing Gear	Hardware	General	Maintenance
<input type="checkbox"/> Bending Passes Below Min	<input type="checkbox"/> Breaking	<input type="checkbox"/> Burrs	<input type="checkbox"/> Set-up
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> Missing	<input type="checkbox"/> Contamination	<input type="checkbox"/> Supplier
<input type="checkbox"/> Cracks	<input type="checkbox"/> Size/Length	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Temperature/Cure
<input type="checkbox"/> Crushed/Crimp at Bending	<input type="checkbox"/> Spinning	<input type="checkbox"/> Documentation/Data	<input type="checkbox"/> Weld
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Threading	<input type="checkbox"/> Finish	<input type="checkbox"/> Wrong Stock Pulled
<input type="checkbox"/> Other	<input type="checkbox"/> Wrong	<input type="checkbox"/> Inspection Incomplete	<input type="checkbox"/> Other
<input type="checkbox"/> Positioned Wrong		<input type="checkbox"/> Inspection Unqualified	
<input type="checkbox"/> Ripples on Inner Bend	Drill Holes	<input type="checkbox"/> Instructions Incomplete/Unclear	
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Misaligned	<input type="checkbox"/> Jigs/Fixtures/Tooling	
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Ovalized	<input type="checkbox"/> Kit Incorrect	
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Over/Undersized	<input type="checkbox"/> Kit Missing	
	<input type="checkbox"/> Too Many		

Work Order ID 85403

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June-07-12 10:35:08 AM

Item ID: D350-748-201

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Item Name: Crosstube Installation, High Aft

Stop ***NS2***

Start Date: 07/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

0.00

130

Crosstubes

Crosstubes

Memo

0.00

1-Drill Tube as per Dwg D350-748-241 Using DT8876 Drill Jigs,
Set-up drill table as per QSI 010

2-Deburr

3-Engrave Part # and Batch # as per Dwg D350-748-241

4-Remove all marks from tube within limits of D350-748-241

5- Apply a light coat of LPS3 on the interior of tube
Batch: _____

140

QC6- Inspect dimensions to drawing

0.00

140

QC

Memo

0.00

Quality Control



12/1/30

12-7-30

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: *[Signature]*Date: *12/08/22*QA Closed: *12/08/22*Date: *12/08/22*

Work Order: <u>85403</u> Part No. <u>D 350-748-201</u> NCR No. <u>12-1739</u>	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input checked="" type="checkbox"/> <i>THIS W/O ONLY</i>	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input checked="" type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input checked="" type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>		Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input checked="" type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>																
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data	<i>12/8/16</i>	<i>165</i>	<i>1</i>	<i>LOAD TEST TO 3000 lb FOR 1 MINUTE PER D.S. EMAIL.</i>	<i>DAS 12 9-89 12/8/16</i>	<i>N/A COMPLETED CP 12/8/15</i>	<i>[Signature] 12/8/16</i>	<i>[Stamp] 12/8/16</i>	<i>[Stamp] 12/8/16</i>
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other	<i>12/8/16</i>	<i>166</i>	<i>1</i>	<i>NDT tube after load test.</i>	<i>DAS 12 9-89 12/8/16</i>			<i>[Stamp] 12/8/17</i>	<i>[Stamp] 12/8/17</i>
Process									
Supplier									
Training									
Unauthorized									

FAULT CATEGORY

Landing Gear	Hardware	General	Maintenance
<input type="checkbox"/> Bending Passes Below Min	<input type="checkbox"/> Breaking	<input type="checkbox"/> Burrs	<input type="checkbox"/> Set-up
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> Missing	<input type="checkbox"/> Contamination	<input type="checkbox"/> Mislabeled
<input type="checkbox"/> Cracks	<input type="checkbox"/> Size/Length	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Off-Set
<input type="checkbox"/> Crushed/Crimp at Bending	<input type="checkbox"/> Spinning	<input type="checkbox"/> Documentation/Data	<input type="checkbox"/> Orientation Misread
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Threading	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Calibration
<input type="checkbox"/> Other	<input type="checkbox"/> Wrong	<input type="checkbox"/> Inspection Incomplete	<input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Positioned Wrong	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Inspection Unqualified	<input type="checkbox"/> Outside Dimensions
<input type="checkbox"/> Ripples on Inner Bend	<input type="checkbox"/> Misaligned	<input type="checkbox"/> Instructions Incomplete/Unclear	<input type="checkbox"/> Over/Under tolerance
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Ovalized	<input type="checkbox"/> Jigs/Fixtures/Tooling	<input type="checkbox"/> Part Lost
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Over/Undersized	<input type="checkbox"/> Kit Incorrect	<input type="checkbox"/> Part Moved
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Too Many	<input type="checkbox"/> Kit Missing	<input type="checkbox"/> Raw Material
			<input type="checkbox"/> Wrong Stock Pulled
			<input type="checkbox"/> Other

Work Order ID 85403

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Item ID: D350-748-201

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Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Installation, High Aft

Start Date: 07/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150

Outsource process-Cadplate per QSI017 4.1.9.1

0.00

150

Outsource3

Outsource process - Cad plate

Memo

0.00

Issue P/O:

Stress relief at 375° for 5 hours

Magnetic Particle Inspect per ASTM E1444

Cadium Plate per AMS-QQ-P-416B, Class I, Type 2

Embrittle relief at 375° for 8 hours, Chromate Treat

Possibe Supplier: Southwest United Industries

Ensure Certificate of Conformity is attached

12-07-31

160

Receive & Inspect for Damage & Mat'l Certs

0.00

160

Packaging

Memo

0.00

Packaging

Ensure certificate of conformity is attached

12/13/00
1X 8012-8-16

★ SEE BACK OF PREVIOUS PAGE

170

QC5- Inspect part completeness to step on W/O

0.00

170

QC

Memo

0.00

Quality Control

DAS 16 17/06/17

Work Order ID 85403

85403

Page 5

June-07-12 10:35:08 AM

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Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180

0.00

180

SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside crosstube as per QSI 005 4.2

2-Paint Outside of Tube as per Dart QSI 005 4.2

121746 start: 11:00
finish: 11:30
22381 start: 4:00
finish: 4:45

12-8-17

190

0.00

190

QC

Quality Control

QC14- Inspect Spray Paint

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

1

12-08-18

200

0.00

200

Crosstubes

Crosstubes

Crosstubes

Memo

0.00

1-Install Ground wire Insert, then insert screw and washer

2-Install Abrasion strips as per Dwg D350-748-241 & QSI 035.

3-Install supports Using Dt8876 as per Dwg D350-748-241, Torque to 60-80 IN-LBS

1

12-08-18

Work Order ID 85403

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Page 6

June-07-12 10:35:08 AM

Item ID: D350-748-201

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

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Start Date: 07/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 21/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00

210

QC

Memo

0.00

Quality Control

220

Pick Kit

0.00

220

Packaging

Memo

0.00

Packaging

230

QC4- 100% Inspect kits for completeness

0.00

230

QC

Memo

0.00

Quality Control

DAS
16
9-8 12/08/20

DAS
16
9-8 12/08/20

12/08/20

Work Order ID 85403

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June-07-12 10:35:08 AM

Item ID: D350-748-201

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N900040100

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Reference:

Approvals: Process Plan: Date:

Tooling:

Date:

Run Start ***NR1***

QC: Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

240

240

Packaging

Packaging

0.00

Memo

0.00

Packaging

Identify and pack for shipping as per PPPD350-748-201

Location: _____

PPP Rev: _____

12/8/2012

250

QC21- Final Inspection - Work Order Release

0.00

250

QC

Memo

0.00

Quality Control

MCS 12/08/20

MCS 12/08/20

Picklist Print

June-07-12 10:35:11 AM

Page 1

Work Order ID: 85403

85403

Parent Item: D350-748-201

D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 07/06/2012

Required Date: 21/06/2012

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev: A New Issue 06-07-05 JLM
 IPP Rev: B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev C Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:D 08-06-24 revD as per dwg DD verified by:EC
 IPP Rev: E 08.12.11 Step17 was step 21 KJ Verified by:EC IPP Rev:F
 10.08.04 added QSI010 4.3 DD verf:EC IPP REV:G ADD
 UNDER BEND COMMENT 12-05-28 JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-241TRN		Manufactured	No			110	Each	2.0000	1	1			
D350-748-241TRN										**			
Crosstube Turning Detail													

DP 12-7-27

Location	Loc Qty	Loc Code
LG	2	
61314	0	
61315	0	
79393	1	
83287	1	

ALS4-1032-225

Purchased

No

200

Each

753.0000

1

1

AI S4-1032-225

Insert

**

W 12.08.12

Location	Loc Qty	Loc Code
ST281	730	
108696	146	
110768	62	
118386	55	
118966	68	
121269	399	
ST282	23	
120410	10	
120451	13	

B#122290

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATEDQA: ☒ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>		AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> Other <input type="checkbox"/> </div> <div> Engineering Quality <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> </div>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data <input type="checkbox"/>											
Equip/Tooling <input type="checkbox"/>											
Operator <input type="checkbox"/>											
Material <input type="checkbox"/>											
Offset/Setup <input type="checkbox"/>											
Other <input type="checkbox"/>											
Process <input type="checkbox"/>											
Supplier <input type="checkbox"/>											
Training <input type="checkbox"/>											
Unauthorized <input type="checkbox"/>											

FAULT CATEGORY				
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong Drill Holes <input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many	General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing	<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material	<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other _____ _____ _____

Picklist Print

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Work Order ID: 85403

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Parent Item: D350-748-201

D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 07/06/2012

Required Date: 21/06/2012

Start Qty: 1.00

Required Qty: 1.00

AN960JD10 NAS1149D0363J Purchased No

200 Each

0.0000

1

1

AN960JD10

Washer

B# 122378

**

W 12.08.18

D2856-400

Manufactured No

200

f

207.9745

1.181

1.243158

D2856-400

Abrasion Strip

**

W 12.08.18

Location

Loc Qty

Loc Code

ST403

197.6

81875

197.6

ST409

10.3745

63735

0.6696

68076

0.3149

71164

8.46

79551

0.93

B# 86905

1- cut as per dwg D2856

D3502-1

Manufactured No

200

Each

81.0000

2

2

D3502-1

Support

**

W 12.08.18

Location

Loc Qty

Loc Code

LG050

60

77041

60

ST051

21

73419

11

74873

10

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>		AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> Other <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> </div>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data											
Equip/Tooling											
Operator											
Material											
Offset/Setup											
Other											
Process											
Supplier											
Training											
Unauthorized											

FAULT CATEGORY				
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong Drill Holes <input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many	General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing	<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material	<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other _____ _____ _____

Picklist Print

June-07-12 10:35:11 AM

Page 3

Work Order ID: 85403

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

85403

D350-748-201

Start Date: 07/06/2012

Required Date: 21/06/2012

Start Qty: 1.00

Required Qty: 1.00

MS21920-20

Purchased

No

200

Each

86.0000

2

2

MS21920-20

Clamp (per MIL-DTL-8783C)

**

12.08.18

B# 122254

Location

Loc Qty

Loc Code

LG050

86

116799

8

120676

8

121067

20

121274

50

MS27039-1-10

Purchased

No

200

Each

126.0000

1

1

MS27039-1-10

Screw

**

12.08.18

B# 122027

Location

Loc Qty

Loc Code

GA

100

120449

100

ST291

26

120120

26

AN4-41A

Purchased

No

220

Each

539.0000

8

8

AN4-41A

Bolt

**

12/8/2012

Location

Loc Qty

Loc Code

360

181

121185

181

ST360

358

115108

3

115705

7

118451

29

118838

50

119328

100

120423

150

121205

15

121573

4

June-07-12 10:35:12 AM

Shop Packet Print

Page 3

Picklist Print

June-07-12 10:35:12 AM

Work Order ID: 85403

85403

Parent Item: D350-748-201

D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 07/06/2012

Required Date: 21/06/2012

Start Qty: 1.00

Required Qty: 1.00

AN960JD516 NAS1149D0563J Purchased No

220 Each

16.0000



8

AN960JD516

Washer

**

1121255

sd

Location

Loc Qty

Loc Code

ST338

16

2612

16

D3500-1 Manufactured No

220 Each

75.0000



4

D3500-1

Saddle

**

sd

Location

Loc Qty

Loc Code

ST423

14

78595

14

ST424

31

73405

20

73406

8

76000

3

ST425

30

76940

30

D3501-1 Manufactured No

220 Each

367.0000



16

D3501-1

Bushing

**

385414 12/8/20 *sd*

Location

Loc Qty

Loc Code

ST051

367

67757

4

73391

6

74866

207

77033

61

81955

26

83253

63

Picklist Print

June-07-12 10:35:12 AM

Work Order ID: 85403

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

85403

D350-748-201

Start Date: 07/06/2012

Required Date: 21/06/2012

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

3,647.000

24

24

**

MS210421 4

Nut

Location

Loc Qty

Loc Code

ST300

3647

119075

116

121011

360

121444

2871

121652

300

24

MS21042L5

Purchased

No

220

Each

1,393.000

4

4

**

MS210421 5

Nut

Location

Loc Qty

Loc Code

300

500

121652

500

ST300

893

108827

8

116105

5

116548

43

117611

18

119109

803

17651

8

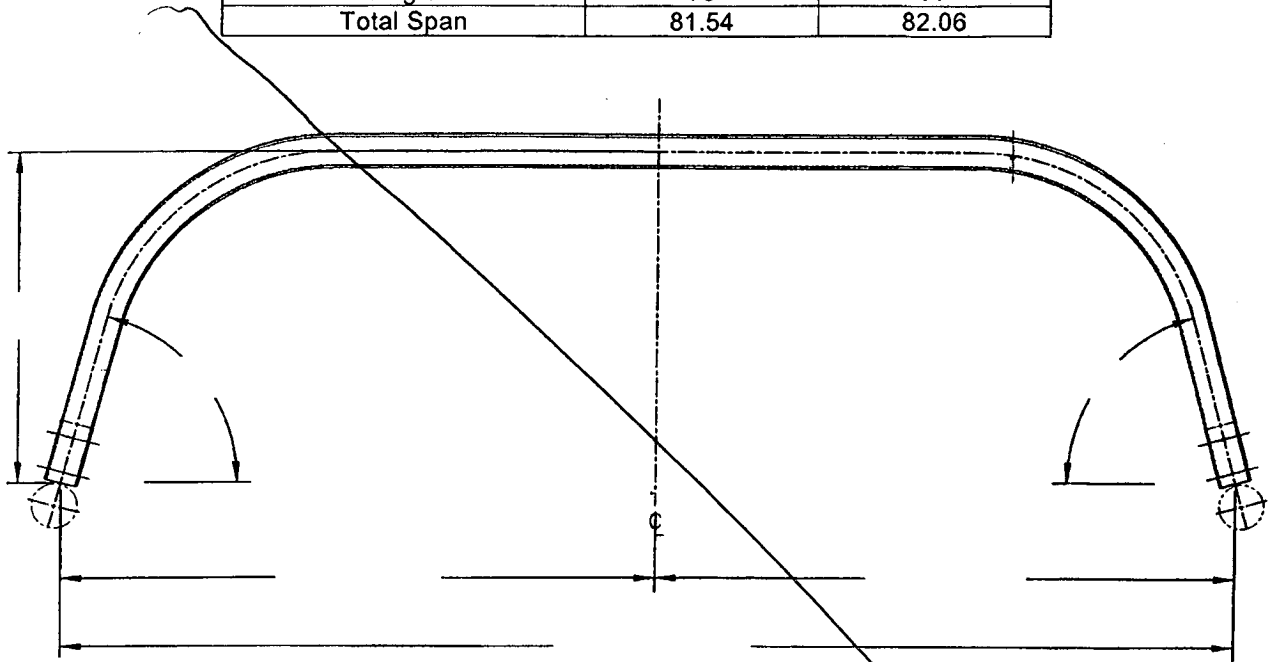
2937

8

4

DART AEROSPACE LTD		Work Order:	<i>85403</i>
Description: Crosstube High Aft (AS350/355)		Part Number:	D350-748-201
Inspection Dwg: D350-748-241 Rev: E		Page 1 of 1	

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06



Comments

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	<i>[Signature]</i>

Item	Qty	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6015-125	CROSSTUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125
FINISHED LENGTH = 122.700±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING
LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER
BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO
CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. *05403 MCT*
12/06/07

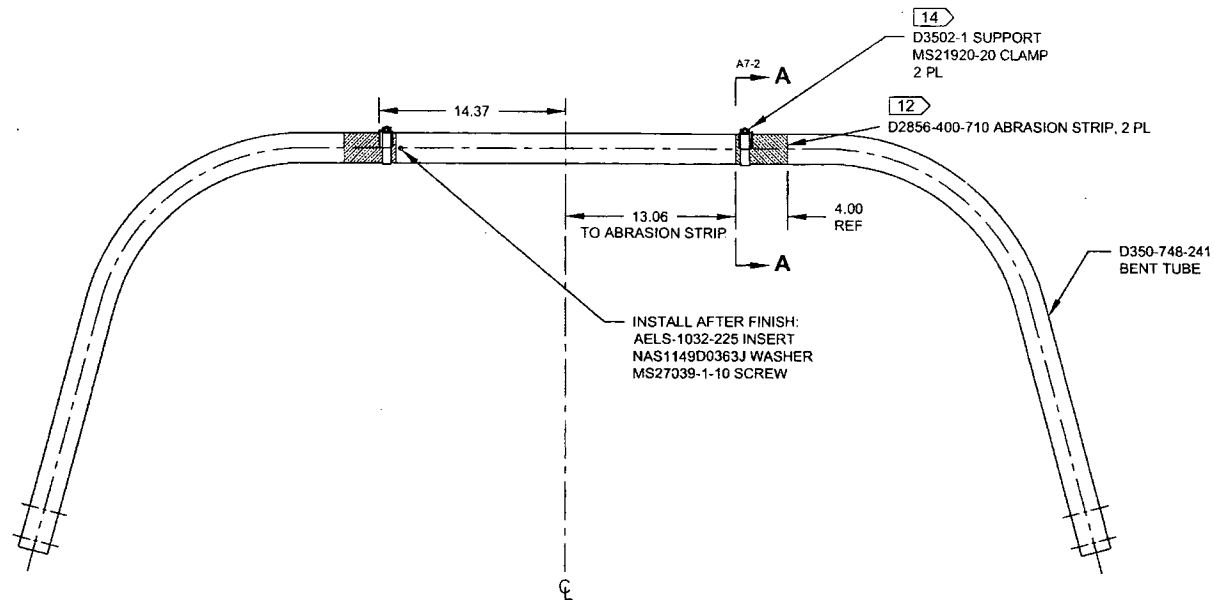
RELEASED
2011-07-08
MR

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>Q</i>		
DRAWN	<i>Q</i>		
CHECKED	<i>E</i>		
MFG. APPR.	<i>E</i>		
APPROVED	<i>H</i>		
DE APPR.	<i>H</i>		
DATE	10.11.23		

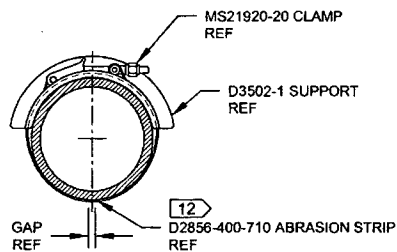
DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. REV. F
D350-748-241 SHEET 1 OF 4
TITLE SCALE
CROSSTUBE (AS 350/355 HI AFT) NTS

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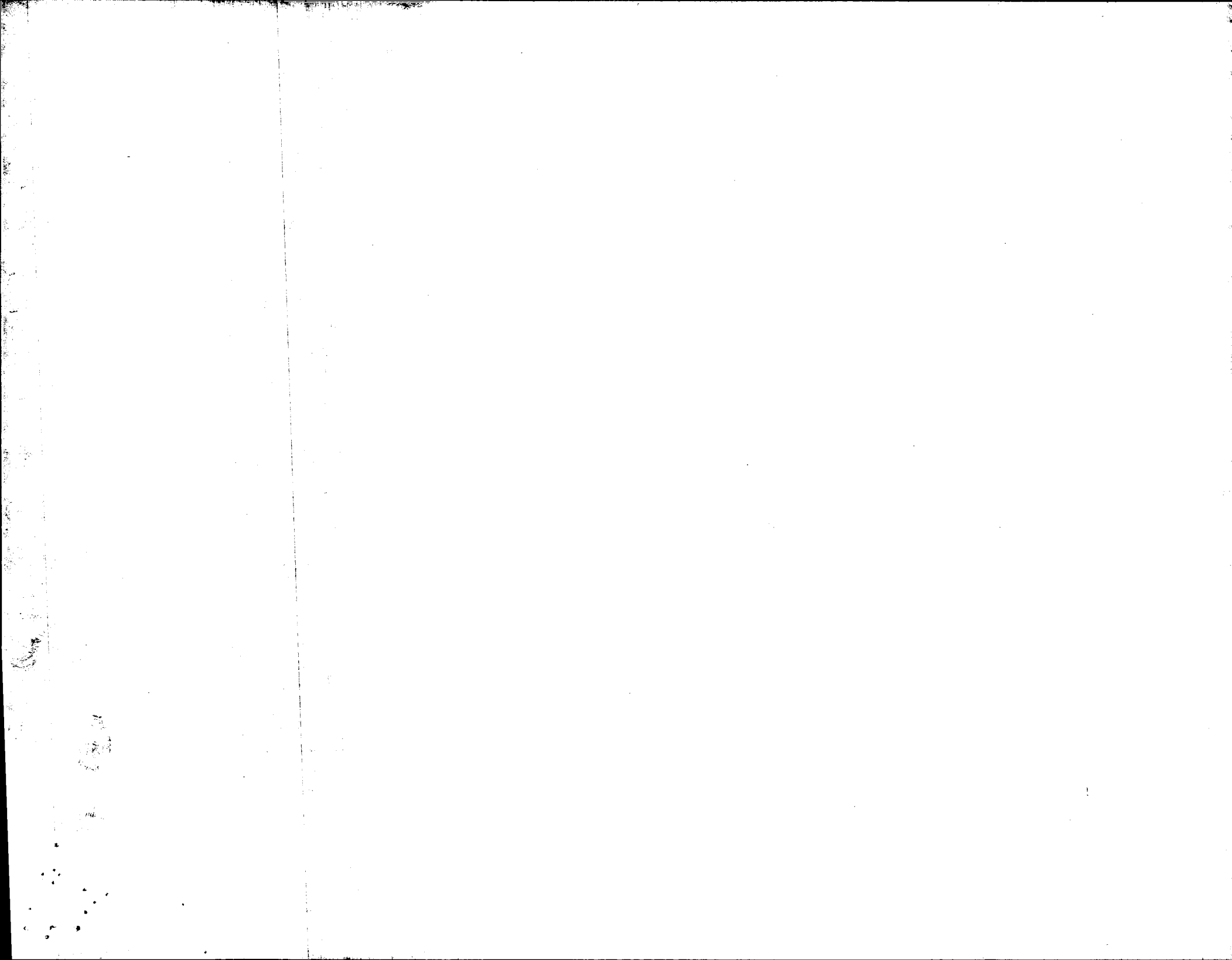
**D350-748-241
ASSEMBLY DETAIL**



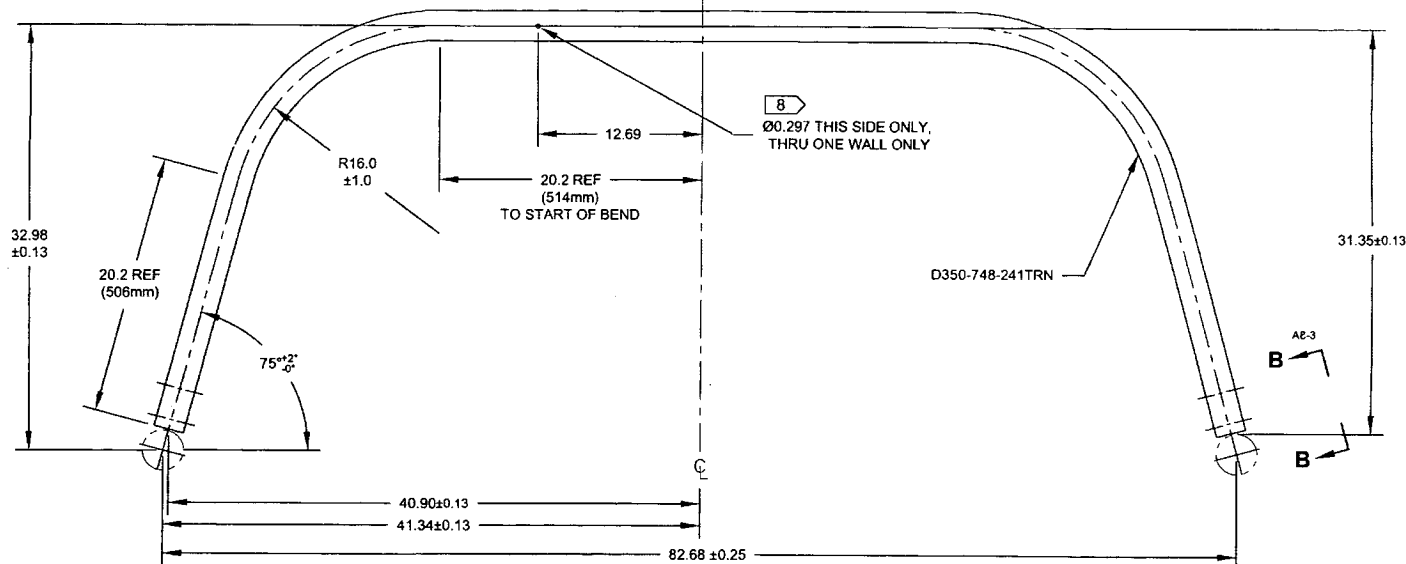
**SECTION A-A D4-2
SCALE 4X**

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2011-06-19

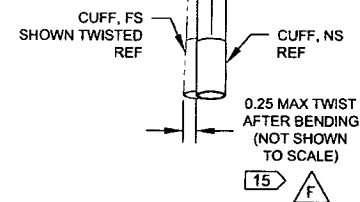
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DRAWN	9P	HAWKESBURY, ONTARIO, CANADA	
CHECKED	B	DRAWING NO.	REV. F
MFG. APPR.	B	D350-748-241	SHEET 2 OF 4
APPROVED	H	TITLE	SCALE
DE APPR.	H	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	



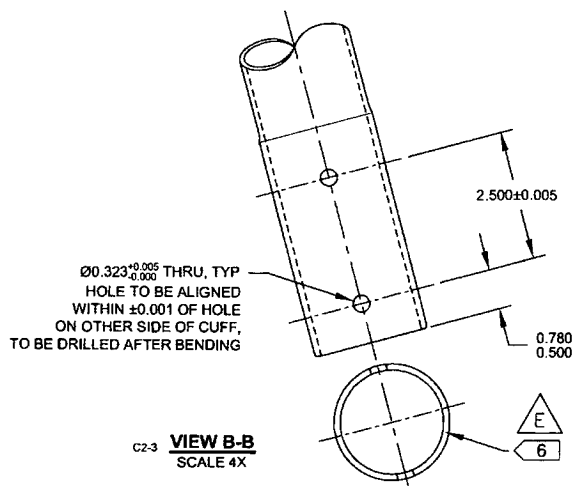
8 7 6 5 4 3 2 1



95403



D350-748-241
BENDING AND DRILLING DETAIL 10

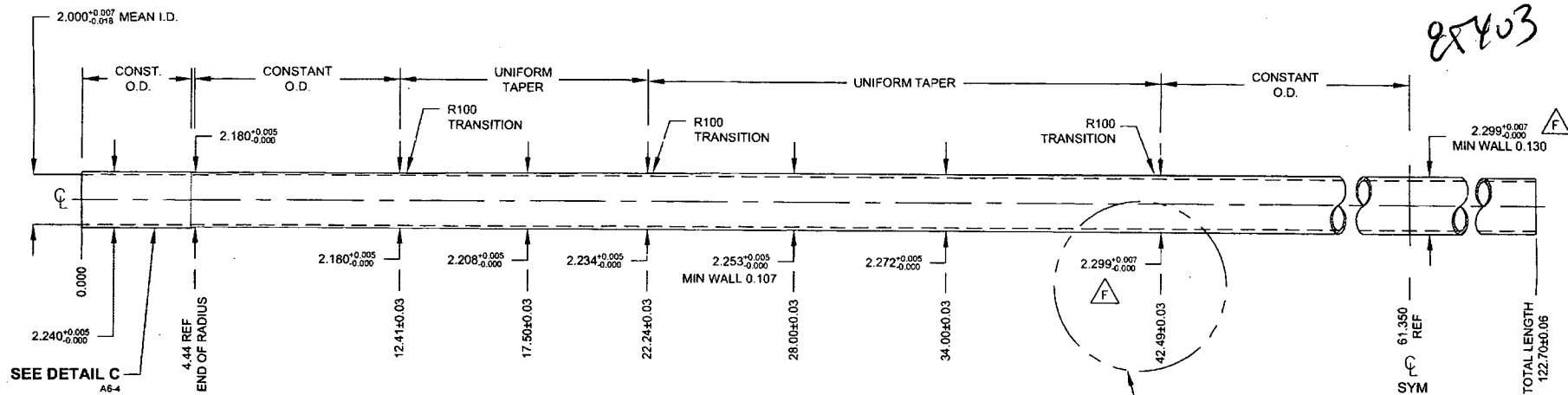


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2011-01-18

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DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. F
MFG. APPR.	90	D350-748-241	SHEET 3 OF 4
APPROVED	90	TITLE	SCALE
DE APPR.	90	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

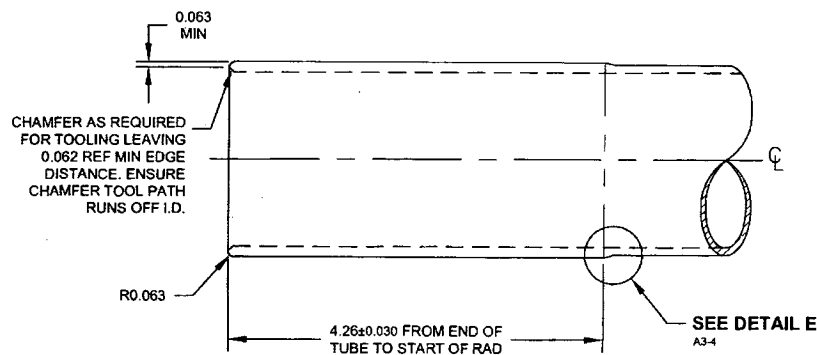
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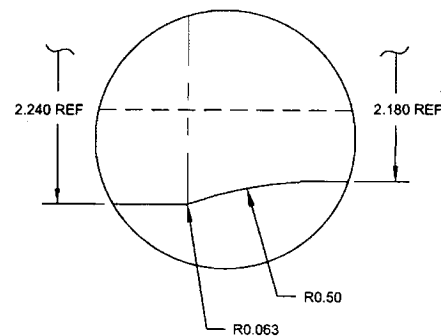


**D350-748-241TRN
TURNING DETAIL**

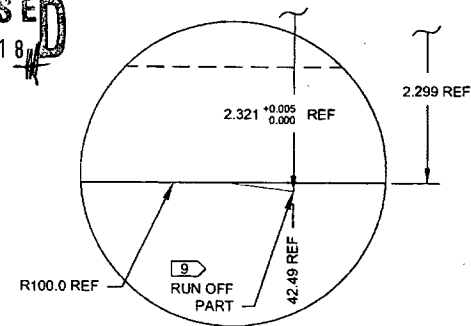
RELEASED
2011-01-18



**DETAIL C:
CROSSTUBE CUFF** C6-4
SCALE 3X



**DETAIL E:
CUFF TRANSITION** A5-4
NOT TO SCALE



**DETAIL D:
TAPER RUN-OFF** C3-4
NOT TO SCALE

DESIGN	4P	DART AEROSPACE LTD	
DRAWN	4P	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ES	DRAWING NO.	REV. F
MFG. APPR.	ES	D350-748-241	SHEET 4 OF 4
APPROVED	4P	TITLE	SCALE
DE APPR.	4P	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Measured Before De-Stress

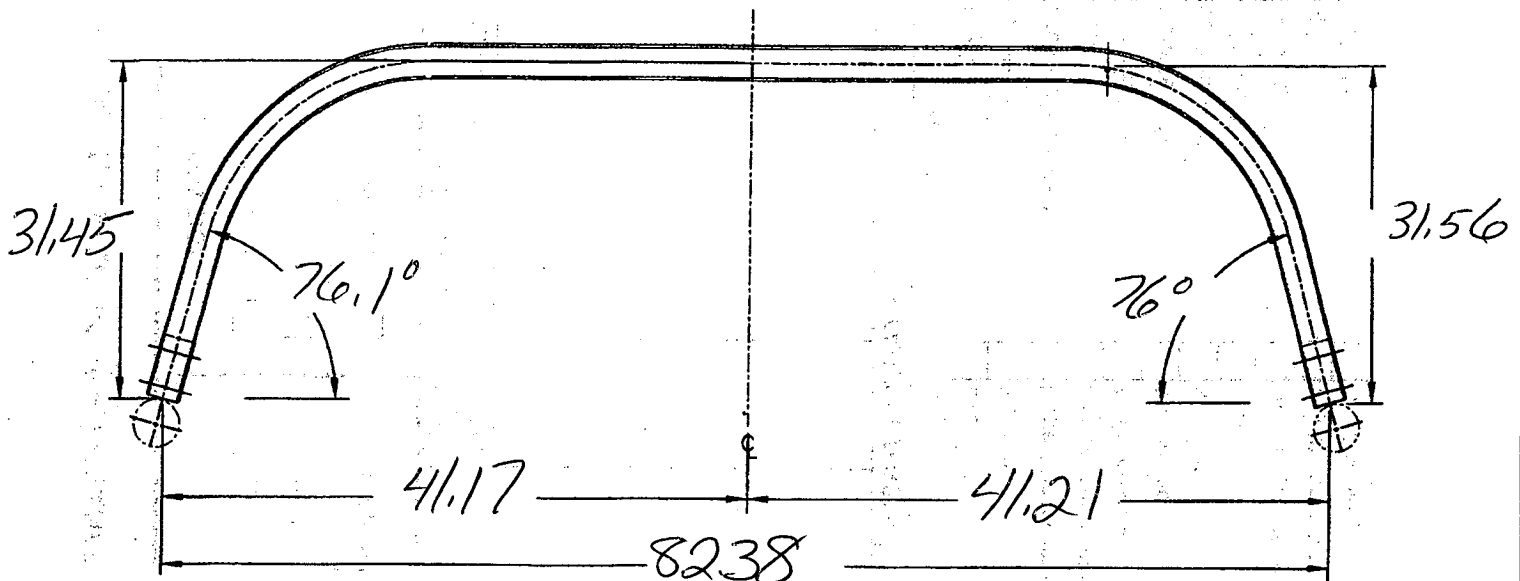
85403

DART AEROSPACE LTD		Work Order:	84988
Description: Crosstube High Aft (AS350/355)		Part Number:	D350-748-201
Inspection Dwg: D350-748-241	Rev: EF	Page 1 of 1	

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	6%
Twist	0.010	0.25

REFERENCE ONLY

12-7-27



	Side A	Side B
Bending Passes	10	8
Crushing		
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

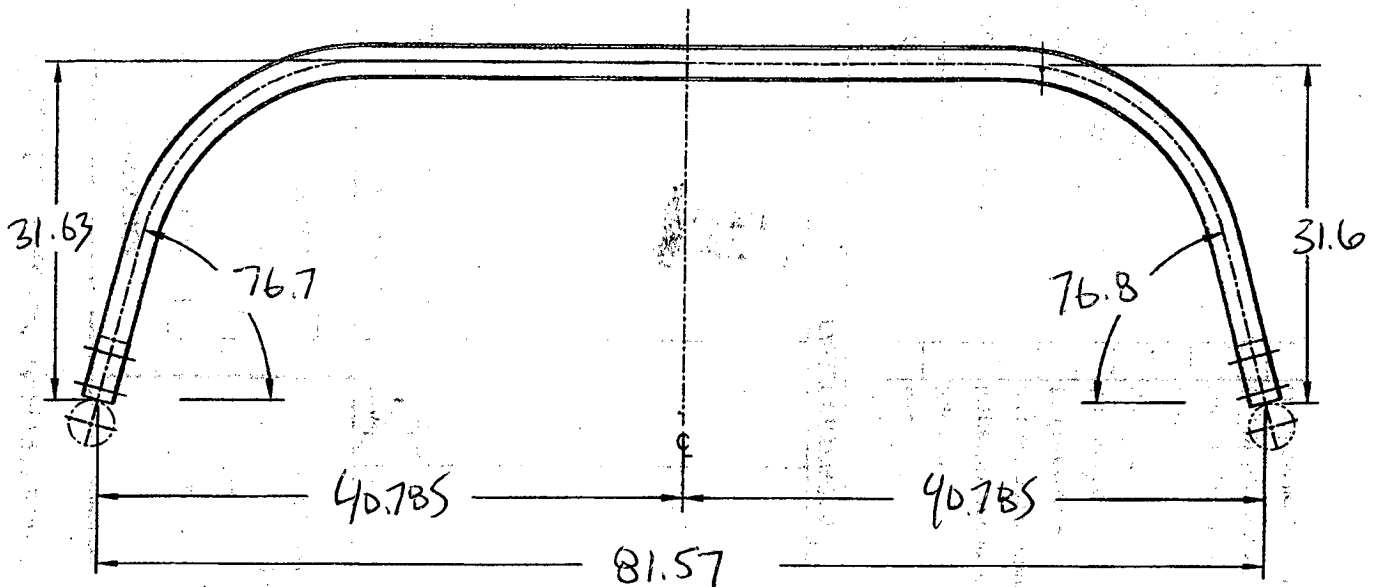
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Setup									
Other									
Process									
Supplier									
Training									
Unapproved									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio	<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions	<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

DART AEROSPACE LTD		Work Order:	85403
Description: Crosstube High Aft (AS350/355)		Part Number:	D350-748-201
Inspection Dwg: D350-748-241	Rev: EF	Page 1 of 1	

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	6%
Twist	--	0.25



	Side A	Side B
Bending Passes	10	8
Crushing	5.7%	4.8%
Comments		
Twist = 0.056"		
Minor ripples in center of bend, Acceptable		

QC15 Inspection	D46
Date	12.7.27

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Setup									
Other									
Process									
Supplier									
Training									
Unapproved									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio	<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Metcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél. : 450 473-4004

Télécopieur / Fax administration : 450 491-5498
Télécopieur / Fax production : 450 491-6454

Certificat de Conformité **Certificate of Compliance**

BON DE TRAVAIL order	CHARGEMENT load
172017	1

Metcor Inc.

CLIENT / client: 215
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
PO17550		Steel		

SPÉCIFICATIONS DU PROCÉDÉ processing specifications

PROCESS / traitement: SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
1	30	D350-748-201

COMMENTAIRES / comments

Certified by:



DATE: 2012-07-27

METCOR INC.
560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8
 Tel: 450-473-1884 / Fax: 450-491-5408

Certificat de Conformité Détaillé
 Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
178017	1

CLIENT / customer 215

DART AEROSPACE
 1270 ABERDEEN
 HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
 1270 ABERDEEN
 HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number						
PO17550		Steel								
<p align="center">SPÉCIFICATIONS DU PROCÉDÉ processing specifications</p> <p>STRESS REL</p>										
<p>EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results</p> <p>Visual</p>										
QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description								
1	30	D350-748-201								
Operation	Temp. spécifiée Specified Temp	Temps de tremp Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
1.00 CONT. INIT.	LAVAGE		si nécessaire							
2.00 PREPARING	COMPTAGE									
3.00 STRESS RE	650	2 hrs	air							
4.00 FINAL INSP										

COMMENTAIRES / comments

APPROUVÉ par / Approved by:



[Handwritten signature]

DATE: 2012-07-30

/ Nous certifions que toute l'information comprise sur ce rapport est exacte et conforme aux requis du client. / We certify that all the information on this report is exact and in accordance with the order requirements.

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>		AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data <input type="checkbox"/>											
Equip/Tooling <input type="checkbox"/>											
Operator <input type="checkbox"/>											
Material <input type="checkbox"/>											
Setup <input type="checkbox"/>											
Other <input type="checkbox"/>											
Process <input type="checkbox"/>											
Supplier <input type="checkbox"/>											
Training <input type="checkbox"/>											
Unapproved <input type="checkbox"/>											

FAULT CATEGORY									
Landing Gear			General						
<input type="checkbox"/> Bending	<input type="checkbox"/> Bend	<input type="checkbox"/> Grain	<input type="checkbox"/> Ovalized	<input type="checkbox"/> Pressure/Forced					
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Hardware	<input type="checkbox"/> Over/Under tolerance	<input type="checkbox"/> Temperature/Cure					
<input type="checkbox"/> Cracks	<input type="checkbox"/> Broken/Damaged	<input type="checkbox"/> Inspection Incomplete	<input type="checkbox"/> Part Incorrect	<input type="checkbox"/> Weld					
<input type="checkbox"/> Crushed/Crimped	<input type="checkbox"/> Burrs	<input type="checkbox"/> Instructions Incomplete/Unclear	<input type="checkbox"/> Part Lost/Missing	<input type="checkbox"/> Wrong Stock Pulled					
<input type="checkbox"/> Cuffs	<input type="checkbox"/> Contamination	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Part Moved						
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Countersink	<input type="checkbox"/> Mislabeled	<input type="checkbox"/> Positioned Wrong						
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Misread	<input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Other					
<input type="checkbox"/> Ripples in Bend	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Offset							
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Drawing	<input type="checkbox"/> Out of Calibration							
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Sequence							
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Folio	<input type="checkbox"/> Outside Dimensions							

Metcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél.: 450 473-1884
Télécopieur/Fax administration: 450 491-5555
Télécopieur/Fax production: 450 491-5555

Metcor Inc. IN THIS CASE

CERT SHOULD REF SPEC THAT
IT IS BEING CERTIFIED TO:

ITS TO THE
DART SPEC OF
"G50 F FOR 2HRS"

Certificat de Conformité
Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
178017	1

CLIENT / customer: 215
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

COMMANDE DU CLIENT customer no.	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
D17550		Steel		

SPÉCIFICATIONS DU PROCÉDÉ
processing specifications

STRESS REL

SHOULD SAY:

→ G50 F FOR 2HRS, AIR COOL

EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results
Visual

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
1	30	D350-749-201

COMMENTAIRES / comments

CERTIFIÉ par / Certified by:



DATE: 2012-07-27



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO17577**

Purchase Order Date 7/31/2012

PO Print Date 7/31/2012

Page Number 1 of 1

Order From :

VC-CAD002

CADORATH COATING
2150 LOGAN AVE.
WINNIPEG, MB R2R 0J2
CA

Contact Name

Vendor Phone 204 633 9420

Vendor Fax 204 633 8033

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr 10127-2607

Terms Net 30

Currency CAD

FOB Destination-Collect

Ship To :

DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	85403	D350-748-201 Crosstube	8/10/2012 Yes	1.00	Day & Ross ppd	\$750.0000	\$750.00

Special Inst: STRESS RELIEF AT 375 ° FOR 5 HOURS
MAGNETIC PARTICLE INSPECT PER
ASTM E1444
CADIUM PLATE PER AMS-QQ-P-416B,
CLASS 1, TYPE 2
EMBRITTLE RELIES AT 375° FOR 8
HOURS CHROMATE TREAT

PO Total:

\$750.00

SP 12-8-16

Change Nbr: 1

Change Date: 7/31/2012

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required - YES NO

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

Packing Slip

**CADORATH**
COATING

Cadorth Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

61931

Sold To:Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

ShipTo:

Net 2% Interest Per Month charged on Overdue Accounts.

Any claims for shortages, overcharges, or damaged goods must
be made within seven (7) days from receipt of goods.

Customer Order #:	Date Received:	Terms:	G.S.T. #:	Ship Via:	Ship Date:
PO17577	Aug-08-2012	NET 30 DAYS	10071 6547 RT0001		Aug-15-2012

Item #	Qty	P/N & Description
1	1 EA	CROSSTUBE
		P/N D350-748-201

S/N 85403

W/O 116682

**CERTIFICATE OF
CONFORMANCE****CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1****DATE:** Aug-15-2012**CONSIGNEE TO:** Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7**W/O #:** 116682**INVOICE #:** 61931**CONTRACT OR
PURCHASE ORDER #** PO17577**DESCRIPTION:** CROSSTUBE**QTY** 1**P/N #** D350-748-201**S/N #** 85403CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 2.
MPI IAW ASTM-E-1444. BAKE HEAT CHART # 12-805 AND # 12-825.**CERTIFICATE:** I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.CI
22**Approved Inspector:** _____

5.0 PARTS LIST

Qty -101	Qty -201	Part Number	Description
X		D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X	D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
1		D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1	D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
*2	*2	D3502-1	SUPPORT
*2	*2	D2856-400-710	ABRASION STRIP
*1	*1	AELS-1032-225	INSERT
*2	*2	MS21920-20	CLAMP
*1	*1	MS27039-1-10	SCREW
*1	*1	AN960JD10	WASHER
4	4	D3500-1	SADDLE
16	16	D3501-1	BUSHING
16	16	AN4-6A	BOLT
8	8	AN4-41A	BOLT
4	4	AN5-32A	BOLT
32	32	AN960JD416	WASHER
8	8	AN960JD516	WASHER
24	24	MS21042L4	NUT (OR MS21042-4)
4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE

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Revision: B

Date: 07.06.15